

Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR 8 — CHART INFORMATION

SECTOR 8

DENMARK—EAST COAST—SKAGEN TO BJORNSKNUDE

Plan.—This sector describes the E coast of Jylland from Skagen to Bjornsknude. The descriptive sequence is from N to S.

General Remarks

8.1 The principal commercial ports described in this sector are Frederikshaven, Alborg, Arhus, and Horsens, in that order from N to S.

The coast, generally low and sandy is indented by several fjords. Limfjorden cuts through Jylland from Kattegat to the North Sea. Small rivers also indent this coast but they will not accommodate deep draft vessels.

That part of the Kattegat lying W of a line joining Laeso and Fornaes, about 47 miles to the S is known as Alborg Bugt. Farther S, a number of islets and islands, intersected by channels that are navigable, lie in the approaches to Arhus Bugt and Arhus.

Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean, Baltic Sea, North Sea, and the Mediterranean Sea, should be consulted for information concerning danger areas and related subjects prior to navigating through the waters covered by this sector.

Tides—Currents

The currents off this coast are seasonal but not easy to predict and can reach a considerable strength.

The tidal range being negligible, the streams, except within the fjords are weak and variable, being largely taken over by the effects of wind and currents. For this sector, notes on tidal currents where relevant, are mentioned under each port.

Skagen to Limfjorden

8.2 The coast between Skagen and a point about 18 miles S curves SW and then SE to form Albaek Bugt. Hirsholmene, a group of islands and islets connected to the coast by a shoal flat, lies about 4 miles NE of the S entrance of Albaek Bugt. Frederikshavn lies immediately S of the same point. The coast then extends about 12.5 miles S to Stensnaes and then 16 miles SSW to the entrance to Limfjorden.

This part of the coast is generally low but S of Frederikshavn a range of hills stands close to the coast and farther S another range rises inland. In addition to the port of Frederikshavn, there are several small harbors which can accommodate shallow and moderate draft vessels. With offshore winds vessels can anchor off most parts of this coast.

Depths—Limitations.—The 10m curve lies about 1 mile SE of Skagen, extends S across Albaek Bugt and then SE to Hirsholmene and then S again passing about 3 miles off Frederikshavn. South of this port the 10m curve gradually extends offshore until it lies about 12 miles E of the entrance to Limfjorden. The depths within this coastal bank between

Skagen and Stensnaes are fairly regular but between Stensnaes and Limfjorden the depths are very irregular. Numerous shoal heads and scattered sunken wrecks lie along this latter stretch of coast.

Note.—Skagen, the NE point of Jylland, as well as Skagens Rev and Skagens Rev Lightship, have been previously discussed in Sector 7.

8.3 Albaek Bugt (57°35'N., 10°33'E.), which lies between Skagens Rev and Hirsholmene to the S, has depths of 18.3 to 23.8m in its central part shoaling gradually toward its head. In depths of less than 18.3m, the sandy bottom provides good holding ground but in greater depths the bottom is hard and of poor holding quality for a secure anchorage.

The N part of the bay is backed by dunes lying close to the shore but farther S, near Frederikshavn, the land becomes higher and woods can be seen.

Aspect.—Useful to the navigator on this part of the E coast of Jylland, is Hulsig Church about 6 miles SW of Skagen; Albaek Church, with a red pointed tower; Jerup Church about 4 miles S of Albaek Church; Elling and Aasted Churches, both painted white with towers about 4.25 miles SSE and 6 miles S, respectively; the sanatorium building in the N part of Frederikshavn, the high white church with a tower and pointed spire and a conspicuous water tower in the town, itself.

Two aero lights are shown, at an elevation of 215m, from a TV mast which stands 8.5 miles WNW of Frederikshavn.

Caution.—Anchoring, fishing, or seabed activity could be dangerous owing to mines in a designated (charted) area in the S part of Albaek Bugt.

8.4 Skagen Havn (57°43'N., 10°36'E.) (World Port Index No. 30440), an artificial harbor, is entered between two converging breakwaters. The entrance between the outer moleheads is 75m and facing SE.

Vessels should, when 0.2 mile from the entrance, keep the range lights in line 334°. Those vessels entering have the right of way over departing vessels. Maximum speed inside the outer harbor is 3 knots.

Tides—Currents.—The tidal variation is 0.3m. A gale from the W may raise the sea level by 1.4m, and from the E, lower the sea level by 0.9m. Winds from the SSW/W cause a NE current and those from N/E/SE, cause a SW current. The prevailing current runs NE, up to 2 knots.

Depths—Limitations.—The harbor at Skagen consists of six basins. Depths are as follows:

Basin	Depth
Outer Harbor	7-9m
East Basin 1	6-8m
East Basin 2	7m
Auction Basin	5-7m
Middle Basin	4-7m
West Basin	5-6m
Pound Net Basin	3.5m



PORT OF SKAGEN

The harbor entrance has a depth of 8.5m. Vessels up to 125m in length, 18m beam, and 7.5m draft can be accommodated alongside.

It is reported (1998) that vessels entering the West Basin are limited to an air draft of 27m.

Pilotage.—The local harbor pilot is available on request to the harbor office. Pilotage is compulsory for tankers over 1,500 dwt; masters of other vessels who are unfamiliar with the conditions are advised to take pilots, or prior to calling or leaving, to obtain information from the harbor watch on the prevailing conditions. The Port Captain's Office may be contacted on channel 16 day or night.

Attention is especially called to the fact that easterly winds can lower the water level by 0.9m, during such weather conditions, it is particularly important to use pilots or to consult the harbor watch as to the prevailing conditions.

The seapilot may take vessels to all harbors on the East coast of Jylland, to The Sound, and through the Great Belt to the Baltic Sea.

Regulations.—Local standard harbor regulations apply with the following exceptions and additions:

1. An outgoing ship shall wait for an incoming ship.
2. Calling at non-freed quay stretches is not permitted without special permission.
3. A berthing plan is worked out for vessels in the harbor. It is prohibited to berth a vessel in a place other than at the quay stretches fixed for the size and type of vessels. Non-local vessels are required to apply to the harbor watch to be allocated a berth.

Albaek Havn (57°36'N., 10°26'E.), a small coastal harbor located in the central part of Albaek Bugt, consists of an outer and inner basin, with depths of 3.2 and 2m, respectively. Silting during the winter months may reduce available depths by up to 0.5m.

Kragskov Rev (57°33'N., 10°28'E.), a group of three rocky patches with depths from 3 to 4.2m, lies about 3 miles SSE of Albaek Havn.

Strandby Havn (57°30'N., 10°30'E.), a small boat harbor, is formed by two breakwaters which protect an outer, central, and

inner basin. A channel 50m wide with a depth of 4m leads into the harbor. The harbor has several basins with depths from 3.5 to 4m. Ships up to 40m in length, 7.5m beam, and a draft of 3.5m can enter.

8.5 Hirsholmene (57°29'N., 10°38'E.) consists, with the exception of some narrow rocky islets, of the two islands Hirsholm and Graesholm. Both are low, flat, and bare of forests; only the latter is inhabited. Foul ground exists between this group and the coast and extends irregularly S to a position about 2 miles E of the N side of the approach to Frederikshavn.

Hirsholm Havn (57°29'N., 10°38'E.), protected by a breakwater, is located on the SW side of Hirsholm. The depth in the approach and at the pier is 3m.

A light is shown on the highest point of the island from a round tower of granite.

Anchorage.—Small vessels can anchor in Holme Havn in depths of about 5.5m about 1 mile WSW of Hirsholm, but this temporary anchorage should be approached from the S. Another temporary anchorage lies about 2 miles SW of Hirsholm, and about 0.5 mile N of Deget, a small bare island on which lie the distinguishable remains of a redoubt.

Aspect.—A fort in ruins and a large white rock on the S side of the island are conspicuous from the offing.

Frederikshavn Approaches

8.6 Frederikshavn can be approached by the North Channel which leads due W passing S of the foul ground and shoals extending S from Deget. The South Channel leads NW from a position about 1 mile farther S.

The North Channel has a least depth of 6.4m and the South Channel, a least depth of 7.9m on the alignment of the lighted entrance range.

Brunerev, with a depth of 2.7m and marked by a buoy, lies about 0.3 mile NE of the N breakwater light. Marensrev, a 3.7m patch, lies about 1 mile ENE of the same light. Trestensrev, with a depth of 1.8m, lies about 0.25 mile farther NE.



Photo courtesy of the Port of Frederikshavn

PORT OF FREDERIKSHAVN

Borrebjerg, with a depth of 2.7m, lies about 0.75 mile ESE of the N breakwater light. Laursrev, with a least depth of 3m and marked by a buoy, lies about 0.1 mile SSE of Borrebjerg. A detached rock, with a least depth of 6m and marked by a buoy, lies about 0.3 mile E of Laursrev. A detached rock, with a least depth of 6.7m, lies close N of the alignment of the entrance range about 1 mile SE of the N breakwater light.

A sunken wreck, with a depth of 11m, lies S of the entrance range about 2.25 miles SE of the same light.

Anchorage.—There is anchorage in depths of 7.3 to 8.2m, good holding ground in **Sodre Red** (57°25'N., 10°34'E.). This anchorage should be approached by passing S of Laursrev.

8.7 Frederikshavn (57°26'N., 10°33'E.) (World Port Index No. 30430) is an ice-free port situated 18 miles S of Skagen. The harbor complex consists of three basins, well sheltered by converging breakwaters.

The outer harbor, which leads to the commercial harbor, includes the following: The E inner harbor, and berthing area for tankers; the ferry harbor which includes the W inner harbor and customs basin; the middle harbor; the fishing harbor on the N side with outer and middle harbor basins; a ship building yard, a boat camber, and the naval harbor on the S side.

There is a yacht harbor protected by breakwaters, S of the naval harbor with depths of 2.5m in the entrance, and from 1.5 to 2.5m within the harbor. A light is shown on each side of the yacht harbor entrance.

Tides—Currents.—The mean range of the tide is about 0.3m. During W gales, the water level may be raised up to

1.2m and with gales from the opposite direction it may be lowered up to 0.9m.

The tidal currents set directly across the entrance between the breakwaters.

Depths—Limitations.—The depth in the entrance, in the greater part of the outer harbor and in much of the general cargo harbor is 8m, although depths of only 7.5m have been reported (1994) on the range line. During gales from the E and SE, when the water level is about 0.9m lower than normal, vessels drawing more than 7m cannot enter the harbor. Container and ro-ro facilities are located in the S inner harbor. There are also ro-ro facilities in the N harbor area 120m long and 20m wide with a depth alongside of 7m. Two general cargo berths, one 200m in length with alongside depth of 5m and another, 300m in length with alongside depth of 7m, are located in the E inner harbor.

Less water has been reported (1994) in the main entrance channel.

Aspect.—In the approach to Frederikshavn from the N or E, Hirsholm Lighthouse and Flade Church are very conspicuous, standing on the highest peak of **Bangsbo Bakker** (57°25'N., 10°28'E.) about 3 miles WSW of the harbor area.

Pilotage.—Pilots can be boarded in the vicinity of Skagens Rev Lightship or at the sea buoy about 2 miles SE of the harbor entrance. Prior arrangements must be made 3 hours in advance on VHF channel 16 or through Lyngby (OXZ) or Blavand (OXB). The vessel's ETA is required as soon as possible. A 24 hour radiotelephone watch is maintained in the harbor office at

Frederikshavn and can be contacted on VHF channels 12, 13, and 16.

Regulations.—Vessels coming from or entering the naval base and the fishing harbor must wait for ships entering or leaving the commercial harbor. Within the harbor limits, the maximum speed permitted is 12 knots outside the breakwaters; 7 knots in the outer harbor; and 3 knots elsewhere in the harbor.

A salvage ship is stationed at the harbor. There are two dry docks, the largest with a length of 215m, capable of accommodating vessels up to 38,000 dwt. There are two medium sized floating docks on the NW side of the entrance to the fishing harbor.

Signals.—During normal conditions, the following traffic signals are displayed from a signal mast on the S side of the outer harbor entrance:

By Day	By Night	Meaning
Black cone, point up, over a black ball.	White light with a red light over and below.	Entry is prohibited.
Two black cones, point to point, with a black ball below.	A green, white, and red light displayed vertically.	Entry and departure are prohibited.
Two black cones points down with a black cone point up in between.	Two green lights with a white light in between.	Departure is prohibited.
Three black balls.	Three red lights vertically displayed.	There is a serious emergency; the entire harbor is closed.

Directions.—If planning to enter Frederikshavn by North Channel steer to bring Berreknob, a conspicuous hill on the N slope of Bangsbo Bakker, in range 268° with the lighthouse on S breakwater and proceed in on this heading to the entrance. At night proceed in toward the entrance remaining in the white sector of the light on the N breakwater. Both of these approach courses pass very close S of the 6.7m patch, lying about 1 mile SE of the N breakwater light.

If approaching by South Channel, steer a course of 315° with Frederikshavn Church seen about midway between the breakwater heads. At night, steer 303° on the alignment of the lighted entrance range beacons to the entrance.

During periods of fog, vessels are advised to use South Channel. Having passed SW of the Lighted Whistle Buoy, moored about 2 miles SE of the entrance, steer toward the shore until depths of 8 to 10m are sounded, then set a course N for the harbor entrance. When the fog signal on the N breakwater is heard, head for it dead ahead, which will lead to the harbor entrance between the breakwaters.

8.8 Saeby (57°20'N., 10°32'E.) (World Port Index No. 30420) lies about 6 miles S of Frederikshavn. It is a small town fronted by a harbor, that has depths of 2 to 3.4m but is subject to silting. Only small vessels can use the harbor.

Aspect.—The village of Bangsbostrand close S of Frederikshavn is conspicuous as is the white building of Karup Church about 5 miles WNW of Saeby. The church and the water tower at Saeby are good marks.

From Saeby to Stensnaes, the land is backed by low dunes about 2 miles inland. Lyngsaa Church, 1.5 miles NW of Stensnaes is conspicuous.

Dvalegrunde (57°13'N., 10°39'E.), a shoal with a least depth of 2.5m and about 4 miles long in a N-S direction, lies about 3 miles E of Stensnaes. The sides of this danger are marked by buoys and a light is shown on its E side. The bottom off this part of the coast is hard sand with weeds in some places. Under certain light conditions the light-colored sand on the shoals is visible for a distance; this is particularly noticeable with respect to Dvalegrunde.

Between Stensnaes and the entrance to Limfjorden, about 16 miles SSW, the coast is flat and partly wooded. There is a range of hills, known as Jyske Aas, several miles inland that rises to a high peak. Knosen, rising to 136m is situated about 9 miles WSW of Stensnaes. Degnehoje and Holdenbjerg, two other fairly high peaks, lie between Jyske Aas and Stensnaes. A few villages can be identified between Stensnaes and the fishing village of Hov about 11.5 miles SSW.

Stensnaes Flak (57°12'N., 10°32'E.), a shoal flat, together with Rimmen, a shallow sandbank, extend up to 6.5 miles SSW of Stensnaes and lie within 1 mile of the coast. Asaa Rende, the channel W of Rimmen can be used by vessels drawing not more than 3m. This channel is buoyed and leads to the fishing harbor at the village of Vorsaa.

A chain of shoals, with a least depth of 4m, extends about 11 miles S of a position about 3 miles E of Stensnaes Flak. The N group of the shoals is known as Middelgrund and the remaining group is known as Svitringen Landdybet. A channel used by small vessels to avoid the strong offshore currents, is entered between Stensnaes and Dvalegrunde and leads S between Middelgrund and Svitringen and the coastal bank to the W.

Local knowledge is necessary to navigate this channel.

Asaa Havn.—This harbor is an island harbor with a depth of 2.2m in the fairway and the outer and inner harbor. Asaa Havn with its shallow drafts can be approached from either N or S of Rimmen.

Limfjorden

8.9 Limfjorden (56°59'N., 10°19'E.), which cuts through Jylland from Hals (57°00'N., 10°19'E.) on Kattegat to its W entrance at Tyboron Kanal, is one of the principal commercial fjords of Denmark.

As a link between the North Sea and the Baltic Sea, its importance is much reduced by the depth at its W end where there is only 4m of water.

The buoyed channel leading to the fjord is entered about 8 miles SE of Hals Barre Lighthouse. The channel passes close S of the lighthouse and then extends about 20 miles in a general WNW direction to Alborg.

Note.—The approach channel and the fjord are buoyed in accordance with the Danish buoyage system.

The fairway from Kattegat to Alborg has a minimum width of 80m and a depth of 9.2m between the bar and Alborg.

In 1981, it was reported that transit marks for use when dredging the channel between Hals Barre lighthouse and Korsholm light towers and 4 more marks on each side of Egeense light towers were in evidence. Each consists of a white pole about 9m high. They are established about 15m apart and are prominent.

A small boat harbor exists on the E side of Egeense Hage causeway and is protected by a 29.8m wide breakwater. The entrance is 19.8m wide and is marked by a buoy approximately 0.25 mile SE. Two 81m long flotation docks extend out from the S side of the basin with depths of 2.5m. The harbor is entered from the 29.8m wide, 2.5m deep entrance which is well marked on both sides by stakes.

Ice.—During E winds, which prevail during periods of frost, the E entrance to the fjord has a tendency to close as the ice packs together. At such times, the bottom ice can present a great hindrance to navigation.

Tide—Currents.—The spring range of the tide in the fjord entrance is 0.6 to 0.8m and the neap range is about 0.3m.

The currents in the entrance change regularly during calm weather, but during bad weather, a current may set in the same direction for a considerable period. The flood sets to the W and the ebb to the E, both at a rate of 1 to 2 knots.

The currents outside the entrance set parallel to the coast and across the dredged channel.

Aspect.—Good marks in the vicinity of the entrance are Hals Barre Lighthouse; Hals Church on the N side of the entrance; a building with a red roof about 4 miles W of Hals Church; the light structures and beacon on Korsholm; and the light structure on Egeensekloster Pynt.

Also useful for making the landfall is Jyske Aas which rises above the generally low land and also Muldbjerger, a hill about 6 miles to the S of the entrance.

Regulations.—Between the E end of the dredged channel across Hals Barre and Alborg, the regulations for navigating in Danish inland waters are in effect, with the exception that the provision concerning the precedence of outgoing vessels applies only in the dredged channel.

Anchorage.—Anchoring is prohibited in the navigational sectors of the lights at Hals Havn which indicate the fairway SE and W of that harbor. Anchoring is also prohibited within 0.25 mile of a line joining the ferry slips at Hals Havn and Egeensekloster.

East Entrance to Limfjord

Vessels anchoring off the various piers within the fjord should avoid obstructing traffic to and from these piers. Vessels passing the piers must proceed at slow speed.

The discharge of ballast, ashes, and oil, etc. is prohibited in the dredged channel and in the channel within the fjord.

8.10 Hals Havn (56°59'N., 10°19'E.) (World Port Index No. 30380), a small artificial harbor, lies along the N side of the fjord about 0.75 mile within the entrance. A limited amount of berthing space is provided for vessels of moderate draft. Depths range from 3.5m in the entrance depths of 3.3 to 4m within the harbor. A depth of 4m exists at the berth alongside

the outer part of the W mole which forms the harbor. Gales from the W and NE raise the water level in the harbor and those from between the E and S lower it.

Pilotage.—Pilots can be obtained from Hals; for Alborg; ports on the E coast of Jylland; The Sound; Store Baelt, and Lille Baelt.

Requests for pilots should be sent at least 3 hours in advance. Pilots board in one of the following positions:

1. One mile NW of Svitringer Rende S light.
2. Near No. 7 lighted buoy (56°50.9'N., 10°48'E.).
3. Eight miles N of Svitringer Rende S light.
4. Seven miles NW of Svitringer Rende S light.

Pilots are available 24 hours. The pilot vessel and pilot station are equipped with VHF.

Pilotage is compulsory from Hals Barre Light to the Alborg harbor area for the following vessels:

1. All vessels with a draft of 6m and over.
2. All tankers of 1,500 dwt and over.
3. Tankers under 1,500 dwt carrying, or with uncleaned tanks that last carried, ammonia or dangerous liquid chemicals.
4. All gas tankers.

Caution.—The existence of a local magnetic anomaly causing considerable disturbance to the compass has been reported 5 miles E of Hals Barre Light.

Langerak (57°02'N., 10°07'E.) is that stretch of the channel between Mou Harbor and Bredhage 8 miles NW. The harbor consists of two moles projecting about 100m from the S shore of the fjord. Within the harbor there are depths of 2.5m.

8.11 Alborg (Aalborg) (57°03'N., 90°56'E.), situated 16 miles above the E entrance of Limfjorden on the S shore, is the principal port for Jylland, and ranks as the third largest port in Denmark.

The controlling factor allowing vessels to be accommodated at the extensive facilities is the depth at Hals Barre.

Some of the berths lie along the sides of the fjord and others within the harbor basins.

Tides—Currents.—The currents off Alborg are irregular and may run in the same direction for several days without any apparent cause. W winds cause a strong E set.

The mean range of the tide is about 0.3m. Winds from W may raise the water level about 0.9m and E winds lower it about 0.6m.

Depth—Limitations.—The port borders both sides of Limfjord and has about 7 miles of total quayage with depths of 6 to 10.1m alongside. The main private wharf fronts the power station. It has a depth of 10m alongside and can accommodate vessels up to 260m in length and 33m beam. There are 13 tanker berths, 125 to 235m long, with depths of 9 to 10m alongside.

The port provides facilities for general cargo, ro-ro, container, tanker, bulk, and passenger vessels. In addition, there are several basins for pleasure craft. Vessels up to 101,600 dwt, 257m in length, and 9.3m draft have been accommodated within the port.

The port can be approached from two directions. Small vessels with drafts up to 3.8m can reach the port from the North Sea via artificial channels at Thyboron and Logstor, and

in Limfjord. This passage is about 78 miles long but can only be made during daylight hours. The main approach is from Kattegat via B7 buoy, through the Svitringen and Egense routes across Hals Bar. This passage has a minimum width of 110m with a least depth of 10.4m in the artificial channel across Hals Bar and a least depth of 10.1m in the fairway leading to the port.

Aspect.—The facilities extending along the S side of the port are backed by the city of Alborg. The facilities along the N side are backed by the town of Norresundby. Hals, fronted by a basin for fishing vessels, is situated at the N side of the entrance to the fjord. A prominent chimney and a church stand close W of the basin.

Hals Barre Light (57°57'N., 10°25'E.), equipped with a racon, is shown from a prominent tower, 15m high and floodlit. The outer channel is indicated by a directional sector light and the inner fairways are indicated by ranges.

Anchorage.—Permission to anchor within the harbor limits must be obtained from the harbor master. Vessels anchoring outside the harbor limits are to ensure their position does not obstruct other vessels approach to, or departure from any berth. Anchoring and the dragging of anchors is prohibited within 200m of the Limfjord tunnel. For vessels berthing at the tunnel basin, that have the need to use an anchor, the prohibited area SW of the tunnel is reduced to 100m. Vessels berthed at Alborg, including those berthed outside the harbor limits, are to use full deck lighting at night.

In order to avoid the telephone cable extending NW from Hals Barre Lighthouse, vessels anchoring in this vicinity should anchor E of the lighthouse.

Anchoring in the channel is prohibited. Vessels anchoring off Hals must keep far enough S so that they do not swing into it. Vessels anchoring off the piers in the fjord must take care to see that they do not obstruct traffic proceeding to those piers. The piers must be passed at slow speed.

Caution.—A road bridge and a railroad bridge cross the fjord W of Alborg. The road bridge has a double-leaf bascule span and the railroad bridge has a single-leaf span. When open, both bridges have a navigable passages 30m wide. A submarine cable area, the limits of which are shown on the chart, lies in the vicinity of the bridges.

An overhead cable, with a vertical clearance of 48m, spans the fjord about 3 miles below the road bridge.

Vessels can pass through either bridge, without charge, seven days a week. For a complete list of the bridge regulations and signals, or any other pertinent details, consult the local Port Information Service at Alborg or the pilotage service.

Vessels over 800 grt or 80m long must use a pilot to pass beneath the bridge.

A dangerous wreck, best seen on the chart, lies close E of the road bridge.

Note.—The waters of Limfjorden, between Alborg and its W entrance bordering the North Sea, are described in Pub. 192, Sailing Directions (Enroute) North Sea.

Limfjorden to Fornæs

8.12 The coast between Limfjorden and Fornæs about 39 miles SE, forms the W and S sides of Alborg Bugt and

encompasses Mariager Fjord and Randers Fjord in its SW part. The entire N section of this coast is low and without any sizable forested areas. Only at ALS Church does this coast rise in a treeless hill, before again dropping down to Mariager Fjord.

There are several fishing harbors along this section of the coast and there are a number of loading places and small ports within the fjords. Randers in Randers Fjord is the largest of these ports.

Between Limfjorden and Randers Fjord the 5m curve extends irregularly S to a position about 2 miles E of the latter fjord and then extends E and SE to Fornæs where it closes the coast. Several detached shoals with depths of 5.5m and less extend up to 7 miles offshore between Randers Fjord and Tangen about 18 miles to the E. The 10m curve extends irregularly S from a position about 9 miles E of Limfjorden into a fairly deep, narrow bight which terminates about 7 miles E of Randers Fjord and then extends irregularly NE to a position about 21 miles N of Fornæs. Numerous shoals, rocky patches, and sunken wrecks lie within the limits of these two curves.

Muldbjerg Grund (56°55'N., 10°22'E.) on the N part of this coastal bank, is a rock with a depth of 2.1m and buoyed on its E side.

Alsrev, a rock with a depth of less than 6m, lies about 2 miles NNE of Als Odde, the N entrance point of Mariager Fjord.

Hevring Flak, a rocky extension of the coastal bank, lies about 5 miles SE of the entrance to Randers Fjord. Fjellerup, a similar extension, lies about 5 miles farther E.

Tangen (56°36'N., 10°45'E.) a large, shoal area in the S part of Alborg Bugt, lies with its W part about 7 miles E of the entrance to Randers Fjord. Its W part has a least depth of about 2.3m but this depth is subject to considerable and sudden changes. The E part of Tangen consists of numerous smaller shoals with depths of 4 to 6.1m. The N most of these shoals lies about 6 miles N of Gerrild Lighthouse (56°32'N., 10°50'E.). The E most shoal lies about 5 miles NE of the same lighthouse.

Oster Hurup (56°48'N., 10°18'E.), a small shallow fishing harbor, lies about 10.5 miles S of the entrance to Limfjorden.

Mariager Fjord

8.13 Mariager Fjord (56°42'N., 10°20'E.) extends about 20 miles in a general W direction to Hobro, a small loading port located at its head. Other ports located within this fjord are Hadsund on the N shore about 7 miles W of the entrance, and Mariager on the S shore about 6 miles above Hadsund.

Tides—Currents.—The spring range of the tide in the fjord entrance is about 0.8m and the neap range is about 0.5m.

Northwest and N gales may raise the water level about 1.5m above the mean water level and SE and S gales may lower it 0.5 to 0.9m.

Outside the entrance to the fjord the currents set N and S at a rate of 1 to 2 knots. In the entrance, the ebbs and the floods occur regularly during calm weather. Toward the inner part of the fjord they decrease, and at Mariager they are imperceptible. Inside the entrance bar the currents set in the direction of the channel at a rate of 2 to 3 knots but during gales the rate may

increase to 4 knots. The currents turn about 2 hours after H and LW.

Depths—Limitations.—The channel in the entrance was dredged to a depth of 5.3m (1983), over a width of not less than 24.4m, and this depth is maintained to the head of the fjord. This depth is also maintained in the channels leading to Dania and Hobro. The harbor at Mariager has a depth of 5.5m.

The entrance channel passing through a sand bar, the bar extending about 3 miles offshore to depths in excess of 5.5m, is subject to silting. A training wall extends about 1 mile E of the S entrance of the fjord.

The dredged entrance channel and the various channel reaches within the fjord, from Als Odde to Hobro are well marked by lighted range beacons and buoys.

The fjord proper can be divided into two distinct parts according to the character of the channel. The E part, from Als Odde to Mollegrund, distant about 11 miles, consists of a narrow, winding channel with depths of 5.7 to 14m. The channel sides are steep-to and the greater part of the water area on either side dries. A channel is dredged across Mollegrund, a shoal which extends across the fjord about 1 mile S of Hadsund.

From Mollegrund to Hobro the fjord is deep up to within 2 miles from its head, except for a narrow, steep-to shorebank on either side. The greatest depth is found off Mariager.

A fixed highway-railroad bridge crosses the fjord at Hadsund. The deep water section of the bridge swings clear to provide two openings, each 22m wide over a channel depth of 5.7m.

An overhead cable with a vertical clearance of 36m spans the fjord about 3 miles W of Mariager.

Aspect.—The land near the entrance to the fjord is low and partly wooded but rises inland. Overgaard Manor House, stands on the S side of the fjord about 3 miles WSW of the entrance and can be recognized by its dark spire and the woods in the vicinity. Vindblaes Church stands about 4 miles farther W. Als Odde Lighted Range Beacons at the fjord entrance are conspicuous from the offing.

Regulations.—In addition to the regulations for narrow channels in Danish waters, the following special regulations are in force between Mariager Fjord Lighted buoy and Dania Cement Works.

The maximum speed for power vessels in the dredged channel is 7 knots.

When it appears likely that vessels of moderate size, proceeding in opposite directions will meet in one of the dredged channels, the vessel proceeding with the current has the right of way. This regulation applies regardless of whether one or both of the vessels are displaying the privileged vessel signal for navigating in Danish inland waters.

No refuse of any type is to be thrown into the fjord.

Pilotage is available from Odde to Mariager and will board in the vicinity of the fairway buoy provided the necessary signal is made in sufficient time. Pilotage is compulsory for vessels over 1,000 dwt, or with a draft of 3.5m or greater.

Directions.—Having arrived close S of the lighted buoy, moored about 6 miles E of Als Odde, a NW course should be steered toward the dredged channel passing SW of the two buoys marking the shoal ground to the N. When the lighted beacons on Als Odde are in range 262° course should be

altered to this heading which will take a vessel in through the dredged channel. If proceeding into the inner reaches of the fjord, a vessel should be guided by the buoys, range lights, and range beacons marking the channel.

Caution.—Vessels without local knowledge are advised not to enter the fjord without a pilot aboard.

Within the Mariager Fjord, there are numerous harbors and loading piers open for navigation all the year round and provide access to Kattegat for cement exports from Hobro, Mariager, Hadsund, and other smaller ports along its shores.

Hadsund Fishing Harbor, on the N side of the fjord close E of the bridge at Hadsund, is a small artificial harbor comprised of two shallow basins.

8.14 Hadsund (56°43'N., 10°07'E.) (World Port Index No. 30340), a small town at the N end of the rail bridge has several berths which line the shore along the fjord. The berths at Hadsund have depths, ranging from 5 to 5.6m alongside. The largest vessel the port can accommodate is 4,000 dwt, 120m in length, and 18m beam.

Dania Cement Works (56°41'N., 10°03'E.), located on the S side of the fjord has berthing facilities at Kongsdal Havn, about 1 mile W of Aamolle Pier, and at Dania Havn about 0.5 mile farther WNW. A coal quay at Kongsdal Havn and a cement and oil quay at Dania Havn are the principal berths. These berths have a depth of 5.6m alongside.

Mariager (56°39'N., 9°59'E.) (World Port Index No. 30350), located on the S side of the fjord about 3.25 miles above Dania, has a small harbor approached through a dredged channel with a depth of 5.5m. The principal quay fronting the town has a depth of 5.5m alongside. A small mole for the use of fishing vessels has a depth of 4.3m alongside.

Blaakilde Mole, on the S side of the fjord close E of Hobro, has a depth of 4.9m and a turning basin adjacent to it has a similar depth, although it has been reported (1991) that the mole is in poor condition and the depths are not maintained.

Hobro (56°38'N., 9°48'E.) (World Port Index No. 30360), the largest town in the fjord, is fronted by a small harbor with about 518m of berthing space available. A depth of 5.5m is maintained alongside all of the berths. These facilities are connected to the railway system.

Strong NW winds veering to the NE may raise the level of the water by nearly 0.9m and SE winds veering to the SW may cause it to fall about 0.3m.

Vessels up to 110m in length with a draft of 5.7m can reach Hobro Havn.

Randers Fjord

8.15 Randers Fjord (56°36'N., 10°20'E.) provides access to Kattegat for the export of agricultural produce and general cargo from Randers Havn 16 miles above the entrance.

Although navigation of the fjord demands local knowledge it can, by day, be negotiated by larger vessels than those which can enter Mariager Fjord.

The channel crosses the bar at the entrance and then narrows to a width of about 0.25 mile within the fjord. From the narrowest part of the channel, the fjord extends in a general SW direction for 9 miles to Ugelhuse and then extends about 6

miles W to Randers. Between the entrance and Ugelhuse the width of the fjord varies between 0.25 and 1 mile but from there to Randers the width is considerably less. Grundfjord extends about 3 miles E from Randers Fjord in the vicinity of Ugelhuse.

Tides—Currents.—The spring range of the tide in the fjord entrance is about 0.8m and the neap range about 0.3m. Gales from the S lower it.

During calm weather, the ebb and the flood are regular in the entrance. Seaward of the entrance, the current sets N and S. Within the fjord the current sets in the direction of the channel; the flood has a rate of 2 to 2.5 knots and the ebb a rate of 4 knots. During unsettled weather, irregular currents prevail and may set in one direction for a considerable period of time.

Aspect.—The land in the vicinity of the fjord is low but rises gradually inland, the steeper slopes being on the S side. The entrance to the fjord in good visibility is easily distinguishable by the dip between the hills.

Landmarks bearing the entrance and the outer part of the fjord are Sodring Church, painted white, about 1.25 miles to the N; Sodringholm Skov close NE of the church; Raaby Church, on high ground about 3 miles WSW of Sodring Church; Udbyhoj Pilot Station on the S side of the entrance; and a beacon on the coastal bank about 2 miles NE of the lighthouse. The spire of Udby Church, about 1 mile SW of Udbyhoj Light, is visible for some distance from some directions over the hills of the intervening land.

Approach to Randers Fjord

Channels—Navigational Aids.—The approach leading to the fjord entrance has a depth of 7m, with a width from 22 to 48.8m. A maximum draft of 5.8m is allowed in the channel.

The channel in the approach, as well as the various channel reaches within the fjord, are well marked by beacons, lighted ranges, and buoys. The buoys are marked in accordance with the Danish uniform buoyage system.

Regulations.—The following special regulations apply to vessels navigating within Randers Fjord:

1. Steam and motor vessels must stop their engines, if possible, and proceed with caution when passing vessels at anchor or moored.
2. The speed of steam and motor vessels must not exceed 6 knots between Skalmstrup Vig, a cove on the W side of the fjord about 4 miles within the entrance, and Randers.
3. When it appears probable that vessels proceeding in opposite directions will meet in a very narrow part of the channel and cannot safely pass each other, the vessel which is proceeding against the current must wait until the vessel proceeding with the current has cleared the narrow part of the channel. This regulation applies regardless of whether one or both of the vessels concerned is displaying the privileged vessel signal described in the regulations for navigating in Danish inland waters.
4. Anchoring is prohibited within 100m of the ferry line between Voer and Mellerup, the cable areas off Drastrup, and between Udbyhoj and Udbyhoj Vasehusene.

Pilotage.—The pilots for Randers Fjord are stationed at Udbyhoj on the S side of the entrance and will meet vessels at the sea buoy provided advance notice is given. It is advisable to

contact the pilot station one hour prior to arrival by VHF radio-telephone on channels 6, 12, and 16. Pilots take vessels to Randers and to other Danish ports in the Kattegat. A lookout is maintained from two hours before sunrise until sunset. Vessels of up to 1,000 grt will be taken in at night provided certain local requirements regarding search lights etc. are met. Send request 6 hours in advance. Night pilotage must be ordered through Hals pilot station.

Vessels are advised not to enter or navigate within Randers Fjord without a pilot aboard because of the narrowness of the channels and the strong currents encountered.

Vessels awaiting a pilot can anchor in the lee of Tangen with onshore winds or in the vicinity of Randers Fjord Lighted buoy with offshore winds.

8.16 Randers (56°27'N., 10°03'E.) (World Port Index No. 30330), open year round, stands at the head of Randers Fjord, about 16 miles above the entrance.

Exports are mainly agricultural, produce, and general cargo. Coal, salt, and timber, are some of the imports.

A vessel up to 140m in length, with a beam of about 19m and a draft of 5.8m, has been accommodated in the harbor. There are ample berthing facilities at Randers.

Tides—Currents.—The flood current predominates and is strongest in both the harbor and the channel. The mean range of the tide is about 0.5m. The water level is raised about 1.8m above normal by N winds and is lowered about 1.1m by S winds.

Depths—Limitations.—The depths in the approach entrance, and within the various reaches of the dredged channels, have been previously given. In both basins, there are depths up to 7m but these may be reduced by silting.

A submarine pipeline is laid across the fjord 50m E of the mole dividing the two basins.

The quays in the N basin have a total length of 1,383m with depths of 3 to 6.7m alongside. The S basin has 500m of berthing space with depths of 3 to 5.9m alongside.

Aspect.—Conspicuous on this section of the coast is Estruplund Church, red in color with a pointed tower. The church stands about 3 miles SSE of Udbyhoj Light. Metlgaard Manor House, white with a red roof, about 10 miles farther ESE and the two white churches at Glesborg and Rimso are good marks.

The red Sostrup Manor House with its tower, about 2 miles S of Knudshoved, and the lighthouses on Knudshoved and Fornæs are conspicuous landmarks.

Pilotage.—Pilots can be ordered at Randers Fjord Pilotage; between 1800-0600 hours it is via Hals Pilotage, which has VHF channels 16, 12, and 13.

The coast between Randers Fjord and Fornæs, about 24 miles ESE, first extends about 6 miles SE to the fishing village of Hevring, then E about 14 miles to Knudshoved, a grass-covered point, and then SE for about 7 miles to Fornæs. This section of coast is generally low and flat but farther inland rises to high, hilly terrain. Gerrild Klint and Sanstrup Klint, two white cliffs each about 1 mile long, line the coast between Knudshoved and Fornæs. The remaining coast is low and wooded.

Hevring Firing Area, marked by buoys, extends about 3 miles NNE from two signal masts situated about 5 miles and 6

miles ESE of Udbyhøj lighthouse. Times when the area is in use are announced in Danish Notice to Mariners and indicated by a ball hoisted at each signal mast and a flashing light from the latter mast by day. At night, a light (flashing red and white) is shown from the mast. In the summer further warnings are given on notice boards situated about 0.2 mile offshore.

Anchorage.—Anchorage can be taken anywhere on the coastal bank between Randers Fjord and **Gerrild Flak** (56°33'N., 10°54'E.) during W and S winds. Tangen provides considerable shelter to vessels anchored in its lee even during NE gales. The clay and sand bottom provides good holding ground.

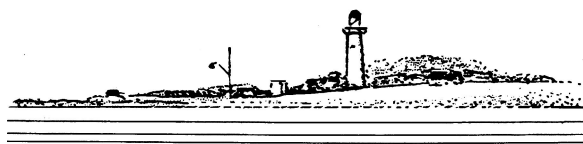
Anchoring is prohibited within a distance of 100m from the ferry line between Voer and Møllerup pier heads, or from the cable off Deastrup Enge.

Fornaes to Sletterhage

8.17 The coast between Fornaes and Sletterhage about 25.5 miles SSW is indented in its S part by Aebeltoft Vig, a bay extending about 7 miles to the N.

Fornaes (56°26'N., 10°58'E.), the E extremity of Jylland is a wide projecting point marked by a light. There is fairly deep water close offshore.

The only ports between Fornaes and Sletterhage are Grenaa Havn, about 2 miles S of Fornaes, and Aebeltoft on the E side. These ports are comparatively small.



FORNAES LIGHTHOUSE BEARING ABOUT 214°

Depths—Limitations.—From a position close E of Fornaes, the 11m curve extends S to a position about 3 miles E of Havknude, and then gradually closes the coast until it lies no more than 0.5 mile offshore about 13 miles farther SW. Several sunken wrecks with depths of 12.8m and more lie at varying distances E of this curve.

Hjelm (56°08'N., 10°49'E.), a small island lying about 3 miles E of Hasenore, rises to a bush-covered hill which is conspicuous from a distance. This island marks the W side of Hjelmabanke on which the irregular depths are less than 20m. Hjelm Dyb, a deep channel, lies between this bank and the coast to the W.

Tvillingerne, two rocky patches with a least depth of 4.3m, lies on the N extremity of Hjelmabanke about 3 miles N of Hjelm. Several rocky patches with shoal depths lie within 1 mile NE and E, and 2.25 miles SSE of Hjelm.

Bjarkes Grund (56°06'N., 10°46'E.), a sandy shoal with several rocky patches, has a least depth of 3m, and lies about 2 miles SSW of Hjelm. It is marked on its NW and SE sides by buoys.

Moselgrund (56°04'N., 10°50'E.), about 3 miles SE of Bjarkes Grund, has a least depth of 4.2m and consists of a sandy bottom with several rocky patches. Its S side is marked by a lighted buoy. It is the S most shoal on Hjelm Bank.

Hjelm Dyb (56°10'N., 10°45'E.), the deep passage between Hjelm and Jylland, is traversed by a buoyed channel which, if carefully followed, will clear all known charted dangers which lie adjacent to it. A least depth of 19m lies in the S part of this channel about 2 miles SW of Hjelm, but elsewhere the depths are much greater.

From Fornaes to Grenaa Havn, about 2 miles SSW, the coast is indented in its N part by a bight where small vessels can obtain good temporary anchorage during the effect of offshore winds.

Aspect.—Prominent landmarks found along this section of coast are the white Hammelev Church, about 2 miles W of Fornaes Light; a mill on Bavnehoj, a hill about 2 miles SW of Hammelev Church; Reolshøj, an isolated hill about 2 miles SSE of the same church; the town of Grenaa and its church, about 2 miles W of Grenaa Havn; and Enslev Church, with a red roof, about 2 miles W of Grenaa Church.

8.18 Grenaa Havn (56°25'N., 10°55'E.) (World Port Index No. 30290) is formed by two breakwaters, each about 400m in length with an entrance between of about 118.9m. It is open year round. The inner part of the harbor is divided by a broad mole into two basins, known as Nordhavn and Sydhavn. The N basin had been extended N to provide two quays, each about 100m long in the SW part, with depths of 7.2m alongside.

Tides—Currents.—The tidal currents in the vicinity change regularly during good weather with the N setting current predominating. The S current is usually weak but with gale winds from NW through NE, the current sets strong E across the harbor entrance.

The mean range of the tide is about 0.3m. NW to N gales may raise the water level 1.2 to 1.8m, and E to S gales may lower it to 1.8m.

Depths—Limitations.—Container cargo is handled at berths 34 and 51, whereas ro-ro vessels are handled at berths 32, 33, 44, and 45. The Oil Pier, 140m in length, has depths of 6.5m on its N and S side.

Berth	Length	Depth
21-23	200m	4.5m
31-33	210m	6.5m
34	110m	6.5m
41	8m	7m
42-44	308m	7m
45	180m	7m
51	210m	10m

The Sydhamn facility is 176m long with a depth of 4.5m alongside. The S side of this basin has about 115.8m of berthing space with a depth of 4.3m alongside.

Pilotage.—Pilotage is not compulsory except for laden tankers with hazardous liquid chemicals or tankers with uncleaned tanks which have carried hazardous liquid chemicals. These regulations do not apply to Masters who have been to Grenaa harbor at least 5 times in the last 6 months. Pilots board in position 56°25.6'N, 11°00.6'E.

Regulations.—There are no restrictions, except that larger vessels should not approach the E breakwater head closer than 80m, in the area E and SE of the E breakwater.

In the approach to the harbor, vessels should be aware of the calcareous reef just outside of the harbor entrance, stretching in an E direction for about 0.7 mile with a 1m depth.

Notice of ETA and request for a pilot should be forwarded to the agent and/or the pilot station 24 and 12 hours prior to arrival. VHF channel 16 is continuously monitored and the ETA may be confirmed or adjusted on this frequency. The pilot boat was reported to be 8m long, with white upperwork and a blue hull with "Pilot" displayed on both sides of the hull. There is no Port Control Radar but the pilot boats are radar equipped.

The pilots that are stationed at Grenaa Havn will take vessels to other Danish ports in the Kattegat and through Lille Baelt and Store Baelt.

8.19 Between Grenaa Havn and Havknude, about 4.25 miles S, the land is low except near Katholm, close NNW of Havknude. In contrast to the low land, wooded hills rise in this vicinity.

A good landmark in this area is the white Also Church with a slate roof which stands about 3 miles SSW of Grenaa Church.



ALSO CHURCH BEARING ABOUT 259°

Between Havknude and **Hasenore** (56°08'N., 10°43'E.), this coast is alternately low with bluffs as far as Jernhattan, a partly wooded point lying about 7 miles NNE of Hasenore. From there, it remains barren and quite hilly until it nears Hasenore, where it becomes low again.

Aspect.—Conspicuous marks along this stretch of coast are Rugaard Manor House, about 6 miles SSW of Also Church; Draaby Church, about 5 miles farther SW; Karlsbjerg, a high hill about 0.5 mile SE of Draaby Church and Skelhoj, a similar hill about 2 miles SSW of the same church; Kobbergaard, a large group of buildings standing close S of a high bluff about 2 miles SE of Skelhoj; and Gydehoj, 17m high, the first conspicuous hill N of Hasenore.

Havknude Flak (56°20'N., 10°58'E.), consisting of a number of shoal patches, extends about 2 miles from the coast in the vicinity of Havknude. A buoy marks the outer edge of this shoal ground.

Klokkegrund (56°08'N., 10°44'E.), a 2.1m rocky patch, lies about 1 mile ESE of Hasenore and is marked by a buoy.

During offshore winds, small vessels can anchor on Havknude Flak and in the bight SW of Jernhattan. Both places have good holding ground.

Aebeltoft Vig and Approach

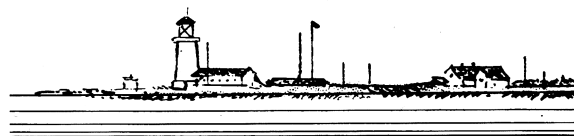
8.20 Aebeltoft Vig (Ebeltoft Vig) (56°10'N., 10°36'E.) is entered between Gaasehage and Sletterhage 6.5 miles WSW. The town and the harbor of Aebeltoft lie in a bight on the SE side of the head of the bay. The shores of the bay are mostly low and flat and sparsely wooded on the E and N sides but rise rapidly on the W side to an aspect of hilly country, inland.

Depths—Limitations.—Oreflak, a butterfly shaped shoal, about 2 miles wide in an E and W direction, lies with its center about 1.25 miles S of Gaasehage. The least depth on this shoal is 4.3m.

Oreflippen, a detached 4.7m patch marked by a buoy, lies about 1 mile farther S. Skadegrund, a shoal composed of sand and stones and having a least depth of 1.5m, lies with its S end about 2.75 miles E of Sletterhage. The SE and SW ends are marked by buoys.

The coastal bank, as defined by the 5.5m curve, gradually extends offshore between Gaasehage and Alhage, until it lies about 1 mile NW of the latter point. Sandhagen, a shoal with a depth of 0.6m at its outer edge, lies within this NW projection of the coastal bank. A buoy marks the NW extremity of this shoal and a buoy marks its NE side. Pladen, a shoal flat with a least depth of 1.8m, lies off the NE side of Sandhagen and extends up to 0.75 mile offshore at Aebeltoft. Pilken, a 5.5m patch, lies about 0.75 mile N of Alhage. Pikkelfgrund, with a least depth of 2.4m, lies about 0.5 mile farther N.

On the W side of Aebeltoft Vig, the shore bank lies close offshore except off the middle part of Helgenaes where it extends up to 0.75 mile off. A 5m patch lies about 2 miles ESE of the isthmus which connects Helgenaes with the mainland.



SLETTERHAGE LIGHTHOUSE FROM THE E

Aspect.—Conspicuous in the vicinity of Aebeltoft Vig are Bøgebjerg, a 44m hill; the buildings in the town of Aebeltoft are good marks, and so is the light-structure at the head of the bay. Three miles, SW of the light structure, three small summits named Trehoje rise up to 126.8m and are excellent landmarks. There is Helgenaes Church; Ellemandsbjerg, 99m high, the summit of Helgenaes, about 1 mile S of the church; and the light-structure on Sletterhage.

A ferry harbor is located about 1.25 miles NW of Gaasehage.

8.21 Aebeltoft Havn (56°12'N., 10°40'E.) (World Port Index No. 30280) fronts the town of Aebeltoft and is used almost exclusively by fishing vessels. It consists of two small basins protected by breakwaters.



HELGENAES CHURCH AND MILL FROM SW

The N harbor, known as Traffic Harbor, is approached through a channel with a depth of 4.5m. Vessels up to 50m long, with a maximum draft of 4.3m, can be accommodated.

The S harbor, known as Fishing Harbor, has depths of 1.5 to 3m.

Anchorage.—Anchorage with good holding ground can be taken anywhere in Aabeltoft Vig, clear of shoals.

Caution.—An area where anchoring, fishing, or seabed activity could be dangerous owing to mines, lies about 5 miles S of Hasenor.

A causeway carrying a pipeline extends SW from the shore about 0.5 mile E of Aabeltoft Vig Light structure, with a pier extending about 131m W from its head.

Arhus Bugt

8.22 Arhus Bugt (56°03'N., 10°23'E.) is that part of the Kattegat W of a line from Sletterhage to Issehoved. In the S it is bordered by Tuno (Tun Island) and the surrounding shallows. The bottom in this bay is constant with depths from 14 to 18m.

The greater part of Arhus Bugt provides secure anchorage over a bottom of stiff mud with a layer of sand in places. The entrance between Sletterhage and Issehoved can be approached through Hjelm Dyb, and by the narrow channel N of Moselgrund, the channels N and S of Marthe Flak, and Lindholm Dyb. From the S the bay can be entered through the passages E and W of Tuno.

Depths—Limitations.—Two shoals, each with a least depth of 6.7m, lie about 4 miles SE and 3.5 miles SSE, respectively of Sletterhage. A detached 11m patch lies about 2 miles ESE of Sletterhage.

Caution.—Two areas where anchoring, fishing, or seabed activity could be dangerous due to mines, lie on the N side of Arhus Bugt.

The port and harbor of Arhus are located on the W side of Arhus Bugt.

Lillegrund (56°03'N., 10°32'E.), with a depth of 1.2m and with lesser depths close E of it, lies about 3 miles S of Sletterhage. A buoy is moored close E of these dangers.

Mejlflak (56°03'N., 10°27'E.), about 3 miles long and 1.25 miles wide, lies close W of Lillegrund. There are general depths of 3.7 to 4.3m, over the greater part of this shoal, but a depth of less than 0.6m lies on its W part. The steep-to W side of this shoal is marked by a buoy. Several shoal patches lie between Mejlflak and Sletterhage.

Wulffs Flak (56°05'N., 10°22'E.), with a least depth of 5.5m and marked by a buoy, lies about 5 miles W of Sletterhage.

Tides—Currents.—The current in Arhus Bugt usually sets N and attains its greatest velocity in that direction but NE gales, commencing without warning, may cause a strong set in the opposite direction.

The N current sets along the E coast of Jylland as far as Arhus and then sets E towards Mols Hoved. It then sets S along the W side of Helgenaes and unites with the current setting N between Sameso and Tuno. Both branches then set across the entrance to Aabeltoft Vig toward Hjelm.

The S current sets in the opposite direction to the N current. W of Sletterhage it decreases in velocity and then continues at a gradually diminishing rate.

During foul weather, particular attention must be paid to the N current.

West Side—Helgenaes

Between Sletterhage and Stavsoer, the NW point of the island, the coast is fringed by a narrow coastal bank and is steep-to.

Landmarks in the vicinity of this part of the coast are the Helgenaes Church, a mill about 0.25 mile SSW and Ellemandsbjerg the prominent hill, mentioned earlier (see paragraph 8.2).

Begtrup Vig (56°09'N., 10°28'E.), a small bay of little commercial importance, lies N of Stavsoer. A detached shoal, with a least depth of 5.6m, lies in the middle of the entrance to the bay about 1 mile NW of Stavsoer. A shoal bank, with some awash rocks on its E part, extends up to 0.5 mile off the NE shore of the bay N of Stavsoer. This group of rocks is known as Ronnen. Small vessels with local knowledge can anchor in the NE port of Begtrup Vig in 4.9 to 6.7m. During N and NE gales, vessels can also anchor in other parts of the bay but at other times W and SW winds raise a heavy sea. In depths of more than 7.9m, the holding ground is usually poor because of weeds.

Kalvo Vig (56°15'N., 10°25'E.), entered between Skodshoved and a point about 2 miles W, extends about 8 miles NE from its entrance. Knebel Vig and Egens Vig, two small bays, lie along its E side. From Skodshoved to Ohoved, about 3 miles ENE, the coast is flat except for a bluff about midway between the two points. The shores of the bay are mainly flat from Knebel Vig around to the W entrance point, but rise to high, partly, wooded country farther inland.

The numerous churches with spires which stand in the villages found around the shores of the bay, as well as the buildings in the town of Arhus, are useful landmarks.

A tongue of the coastal bank, with depths of less than 5.5m, extends about 1.25 miles S from Skodshoved with depths of from 5.5 to 11m, being found up to 0.5 mile farther S. A 6m patch lies about 2 miles SW of the same point.

Ryes Flak, an area of shoal ground, lies with its E extremity about 2.25 miles WSW of Skodshoved.

An abandoned dumping ground with depths of from 3.4 to 4m lies within the limits of this shoal.

A wide shoal bank lies between Skodshoved and Ohoved to the NE and extends up to 0.75 mile from the shore. Pladen, a



Photograph courtesy of Aarhus Stevedore Kompagni A/S
PORT OF AARHUS

shoal with a least depth of 1.8m, lies within the limits of this bank about 0.5 mile NW of Ohoved. This latter shoal is buoyed. Several detached patches, with depths of 5 to 5.6m lie within 0.75 mile NW of Pladen. Elsewhere in the bay the depths are fairly regular with no dangers lying more than 0.5 mile offshore.

Anchorage.—Anchorage, with good holding ground, can be taken throughout most of Kalvo Vig except in its innermost part. Anchorage can also be taken in Knebel Vig and Egens Vig, the two small bays on the E side of Kalvo Vig, but the entrances are narrow and local knowledge or a pilot is required.

Studstrup Havn (56°16'N., 10°20'E.) (World Port Index No. 30285), on the W side of the bay about 4 miles N of Skodshoved, consists of two dredged berths on the N side of a quay 495m long. The berths are suitable for vessels with a maximum length 245m, beam 33m, and draft 10m for tankers. There is a draft limitation of 10m. The depth in the entrance, and at the outermost 405m section of quay is 11.3m. The berths are used by ships supplying the power station at Studstrup.

There is a 190m high chimney at the power station. Two lights in range 304° lead to the harbor entrance.

Restrictions.—The maximum length allowed in Studstrup is 235m. The maximum width allowed is 33m. The maximum draft authorized for dry cargo vessels is 10.7m and for tank vessels 10m. The restricted area situated S of the port, can only be transited between sunrise and sunset.

Prohibited area.—The channel into Kalvo Vig is closed to all shipping with the exception of those proceeding to Studstrup Havn for which permission is required from the Danish Board of Trade. A prohibited area, marked by buoys, in which explosives are dumped, extends across the greater part of the entrance to the bay.

Arhus (Aarhus) (56°09'N., 10°13'E.)

World Port Index No. 30260

8.23 Arhus, the second largest city and port in Denmark, lies on the W side of Arhus Bugt about 10.5 miles WNW of Sletterhage. The port complex consists of several artificial basins divided by breakwaters and moles into four main sections. Ample modern, alongside cargo, and berthing facilities are provided to handle all classes of vessels simultaneously. In addition to its large port area, the city possesses a large number of diverse industries and is an important railroad center.

Tides—Currents.—The mean range of the tide is about 0.3m. Strong W and NW winds may raise the water level within the harbor as much as 1.2m and strong SE winds may lower it about the same level.

The ebb from Arhus Aa, the small river which flows into the S end of Nordhavn, causes a slight outward set along the E quays.

Depths—Limitations.—There is a depth of about 11m on the alignment of the harbor entrance range to a position N of the E breakwater. From here, there are depths from 7.7 to 9m to the entrance to Nordhavn and 7.7 to 11m to the entrance to Sydhavn. The turning basin has a depth of 11.9m.

In basins 1 and 2, there is a depth of 7.5m; basins 3 and 4, have depths of 10m; basin 5 has a depth of 9m; basins 6, 7 and 8 have a depth alongside of 11m; and basins 9 and 10 have a depth alongside of 13.5m.

The N part of Pier 3 has 429m of quayage and a depth of 10m alongside. There are two ro-ro berths with depths of 7.6m alongside. Behind the new quays there is a 25 acre area suitable for the handling of containers. The coal pier can accommodate vessels with a draft of 13.5m.

The W part of Pier 4 has a ro-ro berth with a depth of 10.9m and a hydraulic operated ramp. The E harbor division has a berth with 12m of water alongside, and will accommodate tankers up to 230m in length. There are six berths and night berthing is possible. A new container terminal is scheduled to begin operations in April of 2001 and will also handle ro-ros.

Aspect.—Arhus Cathedral stands near the W side of the harbor about 1 mile WSW of the head of Ostre Molearm. St. Johannes Church, with a tall spire, and Vor Frue Church, with a slender copper spire, stand about 1 mile N and 0.25 mile WNW, respectively, of the cathedral. A water tower stands about 1 mile NNW of St. Johannes Church. The Roman Catholic Church, with a slender spire, stands about 0.3 mile SW of the cathedral. Marselisborg Castle, a large white building, stands about 3 miles S of St. Johannes Church.

The coast 6 miles S of Arhus is steep and wooded up to a distance of 2 miles N of Norsminde, when it then becomes flat, but with few trees. Abelsbøved, a yellow bluff, stands about 4 miles SSE of Arhus Cathedral. A large, yellow warehouse at Norsminde is prominent from the offing.

Marselisborg Castle, 2 miles S of Arhus Cathedral, is a large prominent white building with a flagstaff; a radio mast with aero lights, stands 2 miles farther S.

The coastal bank, as defined by the 5m curve, is fairly narrow from Arhus to a position about 2 miles N of Norsminde, where it extends about 1 mile offshore to form Hesbjerg Grund.

Pilotage.—Pilotage is compulsory for tankers; vessels carrying gas, radioactive material, chemical goods; and vessels using tug assistance. The pilot boards about 1 mile SE of the harbor entrance.

Larger vessels usually take a pilot by the Skaw Light vessel. Pilots should be ordered by ETA telegrams to Skawpilot Skagen, at least 12 hours in advance. Skawpilot monitors VHF channel 16.

Vessels departing the harbor or changing berth should report at least 15 minutes in advance to the pilot station on channel 16 or 12 or to the harbor office. If the movement is delayed, a further report should be sent 10 minutes prior to moving.

Regulations.—Navigation within the harbor area is subject to the general Danish Harbor Regulations with the additional provision that vessels crossing a channel must give way to all vessels proceeding through it.

Signals.—Dredge signals in use in this port differ from the general Danish port regulations. No signal is displayed on that side of the dredge on which passage is prohibited; the fog signal made by a dredge is the same as that made by any vessel at anchor.



AARHUS CATHEDRAL BEARING ABOUT 270°

When the entrance to one of the harbors is closed, two black balls by day, or two white lights by night, vertically displayed, will be shown from a mast on the E molehead of the harbor in question. The limits of the harbors are charted.

Anchorage.—Anchorage can be taken in the roadstead fronting the harbor in depths of 7.3 to 12.8m, good holding ground, over a bottom of sand and mud. It is reported that the best anchorage is about 1 mile E of the breakwater where there are depths of 15m, mud bottom, good holding ground and shelter.

Directions.—A vessel drawing not more than 7.6m and bound for Arhus Bugt by day from N or E can pass through Hjelm Dyb. After passing between Oreringene and Bjarkes Grund, steer to pass midway between Sletterhage Light and the lighted whistle buoy, marking the 7.3m patch lying about 1 mile S of that light, keeping S of Oreflippen and Skadegrund, and clear of the 8.5m patch lying about 4 miles SW of Hasenore.

If drawing more than 7.6m, pass between Yder Flak and Moselgrund, and then between the latter and Marthe Flak.

A vessel with a draft not exceeding 4.6m can, in addition to using the approaches from N and E previously described, pass between Klorgrund and Moselgrund or proceed across any part of Marthe Flak.

After passing Sletterhage, and if bound for either Sydhavn or Nordhavn at Arhus, steer to pass close N of the head of Ostre Molearm, keeping S of the 6.1m shoal, marked by a buoy, about 0.25 mile ESE of the entrance to Lystbaadehavn.

Vessels of deep draft, bound for Arhus Bugt by day from S, can pass E of Samso through Lindholm Dyb, or W of Samso between that island and Tuno. The various channels W of Tuno are available only for small vessels with local knowledge.

Passage through Lindholm Dyb presents no difficulty. After leaving the N entrance to this channel, steer to pass between Vejro Flak and Langballe Grund, continue E of Klepperne and the shoals about 4 miles SE and 3.5 miles SSE of Sletterhage, and enter Arhus Bugt through the channel S of Sletterhage.

If using the channel W of Samso, and having passed that island and Tuno, steer to pass E of the buoy marking Lillegrund, taking care to avoid a 6.1m shoal lying about 2 miles W of Issehøved. After passing Lillegrund, steer to pass through the channel S of Sletterhage.

To approach Arhus Bugt from N or E by night, use the channel S of Moselgrund. Having cleared Moselgrund, proceed W until in the white sector of Sletterhage Light. Keep in this sector until about 2 miles ESE of the light, then steer to pass midway between Sletterhage Light and the lighted whistle buoy to the S. Having passed Sletterhage steer WNW until the range lights leading to the harbor at Arhus are in line.

Caution.—The approach from the S is not practicable at night for vessels drawing more than 7.6m; the channel W of Samso must be used.

The coast between Dyngby Hoved and Bjornsknude, about 17 miles SSW is indented by several small bights, and fronted by an extensive shoal area. Several small islets and islands lie within the limits of the shoal.

Horsens Fjord sets into this part of the coast and includes the only port of any commercial importance.

Samso, a long, narrow island of irregular shape, lies on an area of shoal ground about 9 miles offshore and is separated from the coastal bank to the W by a narrow, deep, navigable channel.

The depths off the greater part of this stretch of coast are very irregular, and extensive shoal areas extend far offshore. The 11m curve lies as much as almost 10 miles E of Kolsnakke and nearly 7 miles SSW of that point. Depths in excess of 11m S of the entrance of Horsens Fjord permit vessels of moderate draft to approach the entrance to the fjord and then proceed to Horsens through a channel with a least depth of 6.8m.

Large ships at anchor may obscure the range lights.

Kysinge Hage (56°01'N., 10°17'E.), a rocky spit with a depth of 1.8m near its outer end, extends about 1 mile NE from Kysing Naes, the S entrance point of Norsminde.

Norsminde Flak, a narrow flat with a least depth of less than 0.9m and 1.75 miles long, lies parallel to the coast about 2 miles E of the entrance leading to Norsminde.

The channel between Norsminde Flak and the coast has depths in excess of 9.1m except for a depth of 5.5m in its S part.

Several detached patches with depths of 5.3m lie within 1 mile S of Norsminde Flak and similar patches with depths of 5 to 5.9m lie within 1 mile N and NE of it.

8.24 Norsminde (56°01'N., 10°16'E.) yacht harbor is situated at the entrance to Norsminde Fjord. It consists of a basin with several jetties up to 50m in length, having a depth of 2.2m. The entrance channel is marked by buoys, and a light is shown from a metal post at the head of a shelter mole, which extends about 140m NE from the N entrance point.

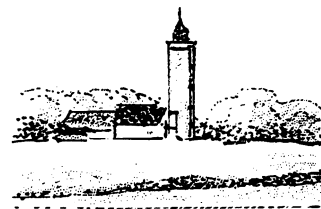
Submarine cables are laid from Kysing Naes, and a position 1.5 miles SSW, to the NW side of Samso.

Dyngby Hoved (55°58'N., 10°16'E.), a point about 4 miles S of Kysing Naes, has a conspicuous white church with a red roof about 1 mile NW of it. Dyngby Hage, a shoal with a depth of 5.6m at its outer edge extends about 1 mile E of the N part of Dyngby Hoved.

Tuno Island (55°57'N., 10°26'E.), a small island, lies with its center about 6 miles E of Dyngby Hoved. The center of the island is its highest part. A white church tower on the E part of the island serves as a light structure. Trees surround the church and stand E of it. A shoal with depths of 10m and less extends up to 1.5 miles N from the N side of the island and 0.25 to 0.5 mile from its W and S side. Tuno Ron, a narrow sandspit which dries on its outer part, extends about 0.5 mile ENE from the E end of Tuno. Mollekaegrund, a 2.1m rocky patch lies within the coastal bank which extends up to 0.5 mile from the SE side of the island.

Tuno Havn (55°57'N., 10°27'E.), a small harbor formed by two breakwaters, has a depth of 3.2m in the entrance and within the basin. Only small craft can be accommodated.

Tuno Knob, a narrow, awash sandbank, lies on a shoal bank, about 2 miles in extent, about 1 mile W of Tuno. An ammunition dumping ground, marked by four buoys at its corners, covers most of Tuno Knob.



TUNO CHURCH BEARING ABOUT 169°

Aschehougs Flak, a group of shoal patches with a least depth of 3m, occupies the greater part of the passage between Tuno Knob and Dyngby Hage.

Kirkegrund, a small shoal with a least depth of 2.7m, lies about 2 miles S of the W end of Tuno.

Svanegrund (55°50'N., 10°25'E.), a large shoal area with depths of less than 5.5m, is joined to Sogrund at its W end and to the coastal bank which surrounds the island of Endelave. Svanegrund extends about 10 miles E of Kolsnakke and consists of numerous rocks and a number of drying flats.

Endelave (55°45'N., 10°19'E.), a flat island surrounded by shoal ground, lies about 5 miles SE of **Kolsnakke** (55°50'N., 10°12'E.).

Aspect.—The church in the village on the N coast, a windmill on the W side of the village and a small grove on the SE part of the island are prominent.

8.25 Hov Havn (55°55'N., 10°16'E.) consists of a yacht harbor and E of it there is a new ferry harbor. Each is protected by moles.

Hov Ferry Harbor Light is shown on the NE side of the entrance to the ferry harbor.

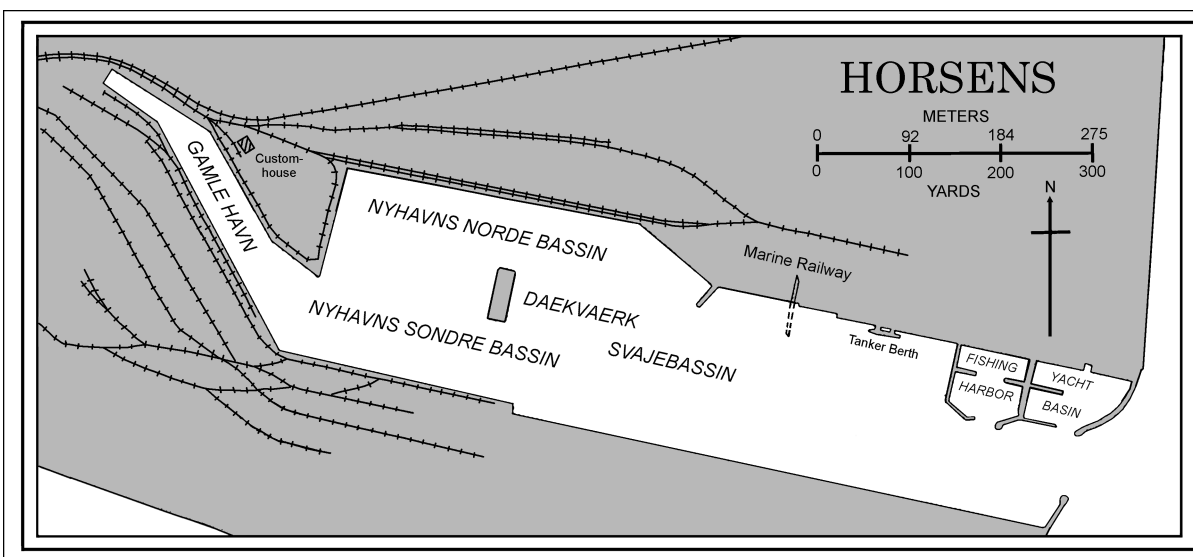
Depths—Limitations.—These harbors at Hov Havn are approached by a dredged channel 37m wide, which leads SW from Hov Lob. As far as the ferry harbor entrance, the channel has depths of 3.8m, and is marked on its NW side by two light beacons and on its SE side by a buoy and a lighted beacon.

The yacht harbor entrance has depths of 3.2m and is marked by buoys.

Depths in the ferry harbor are 3.8m in the main part and 3.5m in the N and W parts. In the yacht harbor there are depths of 3.2m.

Approaches.—Horsens Fjord is approached by a channel which lies about 4 miles W of Endelave and leads between the islands of Hjarno and Alro and the coast to the W. The S part of this channel is known as Hjarno Sund and the N part as Draget. Alro Sund lies between Alro and Hjarno and can be used by small vessels with local knowledge. Both of these islands are low, partly wooded, and heavily populated.

The land on both sides of the fjord rises abruptly to fairly high wooded hills near the entrance, but descends gradually to fairly low terrain near its head. South of the entrance, the general line of the coast is broken by Ashoved, a wooded peninsula with a low yellow cliff at its outer end. Asvig and Sandbjerg Vig, two small bays, lie on either side of this projection.



The principal entrance channel leading into Horsens Fjord has depths ranging from 7 to 22m in Hjarno Sund and Draget, and a depth of 6.9m in the dredged inner section leading to the port area. Only those dangers which lie in or adjacent to the above channels will be described.

Bjornsknude Rev, with depths of less than 5.5m, extends about 2 miles SE from Bjornsknude, a point about 4 miles SSW of Ashoved. Bjornsknude Flak, a flat with similar depths, extends about the same distance E of the coast close N of Bjornsknude.

Ashoved Flak, which consists of several rocky patches with a least depth of 0.6m, extends about 0.5 mile E of Ashoved.

Lillegrund, a shoal with a least depth of 5.3m, and Middelflak with a least depth of 4.3m, lie 2 miles ESE and 1.75 miles ENE, respectively, of Ashoved.

Sondergrund, a rocky patch with a least depth of 4.6m, lies about 1 mile S of Hjarno.

8.26 Horsens (55°52'N., 9°52'E.) (World Port Index No. 30230). The port complex at Horsens consists of several harbor basins protected by converging breakwaters. It is an ice free port, where one basin is designated for yachts and the other for small fishing vessels. These facilities which lie on the N side of the harbor, are situated immediately within the entrance.

The tanker berth lies close W of these two basins. The rest of the harbor area is used for the handling of general cargo.

Tides—Currents.—Under normal conditions the currents within the fjord change about every 6 hours, setting in the direction of the fairway at a rate of about 1 knot. During storms, the currents in Hjarno Sund and Draget may attain a rate of 2.5 to 3 knots, and may set in the same direction for up to 12 hours. The water level rises with N gales and is lowered with S gales.

Depths—Limitations.—The maximum length of a vessel that can be accommodated at Horsens is 160m long, a beam of about 21.3m, and a draft of 6.7m.

The depth in the dredged entrance channel and over much of the general harbor area is 6.9m but this depth may decrease because of silting.

There are sixteen berths; one for passengers, ten for cargo, two for small boats and three for tankers, located at:

Esso with 5.6m alongside.

DAK with 6.9m alongside.

KH with 6.9m alongside.

Nyhavns Nordre Bassin has 480m of berthing space with a depth of 6.3 to 6.9m. Nyhavns Sodre Bassin has 615m of berthing space with a depth of 6.3 to 6.9m.

Gamle Havn, in the inner reaches of the main harbor, has 550m of space with depths of 4.2 to 6.3m alongside.

Aspect.—Hundslund Church, about 7 miles NW of Kolsnakke, together with Gangsted Church about 2 miles farther NW, can be seen from the offing but they have been reported difficult to make out. Sovind Church, about 2 miles SW of Hundslund Church, is visible only within the fjord. Frelser Church, with a slender spire, stands in the city of Horsens at the head of the fjord. Uth Church stands on the S side of the fjord about 3 miles SSE of Frelser Church. Borre, a peninsula marked by some bare hummocks, lies about 2 miles NW of Hundshage. A large conspicuous warehouse is located at Snaptun about 1 mile NNW of Hundshage. A church stands on the SW side of the island of Hjarno and a church stands in the central part of Alro.

Landmarks on the W side of the approach to Horsens Fjord include Askirke Church, about 2.25 miles WNW of the extremity of Ashoved; Palsgaard Manor House, about 1 mile SSE of Askirke Church; the red buildings of a railroad station; and, a hospital at the village of Juelsminde, about 3 miles SW of Ashoved. A chimney stands close SE of Juelsminde Church and one NW of the hospital.

Pilotage.—The pilot station is located at Juelsminde and can be contacted on VHF channels 16, 12, and 13. Pilots board vessels bound for Horsens near Lillegrund buoy, about 2 miles SE of Ashoved. Pilotage is controlled by Lille Baelt Pilots.

Vessels awaiting a pilot can anchor as convenient in Asvig Bay between Ashoved and Hjarno clear of the entrance range.

Regulations.—Vessels in the dredged channel must not exceed a speed of 6 knots when within a distance of 2 miles of the harbor entrance at Horsens.

Anchorage.—Anchoring in the dredged channel and in an area S of the dredged channel about 1 mile SE of the harbor entrance is prohibited.

8.27 Samso (55°52'N., 10°38'E.) extends in a general S direction from Issehoved, its N extremity, to its S extremity due E of Endelave Island. The island consists of two distinct parts, Nordby Land the smaller part, being connected to the larger S part by Nordby Hede, a narrow isthmus. The island is hilly and sparsely wooded. Dyret, a prominent dome-shaped hill, 51m high, rises on the W side of the S part of the island and is visible from all directions.

Samso Baelt, the N approach to Store Baelt is bordered on its W side by the banks and shoals lying off the E side of Samso. The E side of Samso Baelt lies between Sjaellands Rev and Rosnaes Puller.

Off-lying islands.—**Marthe Flak** (56°02'N., 10°52'E.), a bank with several shoal patches on it, lies centered about 10 miles E of the N point of Samso. The shallowest part of the bank consists of two 5.5m patches which lie on its S part. A rock, with a depth of 7.3m, lies on the N part of the bank about 10.5 miles ENE of the N point of Samso. A 9.6m rock lies about 8 miles E of the same point.

Samso Ost Flak, a bank with general depths of less than 18.3m except in a few places, extends from the N and central parts of the E side of Sargasso. This bank extends up to 14 miles E from Issehoved, the N point of Samso, and has several shoals, rocks, and islets on it.

Vejro (55°57'N., 10°46'E.), a flat, bush covered islet, lies about 7 miles ESE of Issehoved. It is highest on its E side and a conspicuous yellow bluff marks its S side. A beacon stands on the N side of the islet. Nordvestrev, a narrow reef which almost dries, extends about 0.5 mile W from the W end of Vejro and is steep-to on its S side. A foul area is located about 4 miles SSE of Vejro. A number of rocks lie on the coastal bank S of the islet.

Vejro Flak (55°58'N., 10°46'E.), an area of shoal ground with depths of less than 5.5m lies centered about 2 miles N of Vejro. Flensborg Grund, a detached patch with a least depth of 2.4m lies close E of Vejro Flak.

Langballe Grund, a detached shoal with a least depth of 5.5m, lies about 3 miles NW of the beacon on Vejro and is marked on its SE side by a buoy.

Bosserne (55°56'N., 10°47'E.), two low, narrow islets, is on an extensive area of shoal ground about 0.5 mile SE of Vejro. Vejro Sund, a narrow, deep passage lies between this shoal ground and Vejro.

Submarine cables are laid from Kysing Naes, and a position 1.5 miles SSW, to the NW side of Samso.

Tides—Currents.—The N current from Store Baelt, usually caused by winds from the NE through E and S to W, divides into two branches S of Samso. The main branch passes E of Samso and the other branch passes on both sides of Paludans Flak and W of Samso, where it unites with the N current from Lille Baelt. The currents on both sides of Samso unite near Hjelm.

The S current is usually caused by N and W winds.

8.28 Samso—East side.—**Issehoved** (56°00'N., 10°34'E.), the N extremity, is a low point fronted by shoal ground which extends up to 2 miles N and about 2 miles E from it. Issehoved Flak with depths of less than 5.5m and Issehoved Rev, a partly drying reef, lie within the limits of this shoal ground. Klepperne, some rocky patches with a least depth of 2.1m, lie on the NE part of Issehoved Flak about 2 miles NE of Issehoved.

Nordby Bugt (55°57'N., 10°37'E.) lies between Issehoved and the shoal areas extending N and NE from the entrance to Stavns Fjord. The coast is high between Issehoved and the town of Nordby about 2 miles to the S. South of this town the land decreases in height to Nordby Hede. Bylykke Skaar, a conspicuous cleft in the coast lies about 2 miles S of Issehoved. A radio tower about 3 miles S of Issehoved, and Nordby Church, painted white with a red roof about 3 miles S of the same point, are conspicuous landmarks.

Lindholm Sund (55°55'N., 10°41'E.) is narrow and obstructed by a ridge with a depth of 4.3m which extends across the channel S of Lindholm.

Stavns Fjord (55°54'N., 10°39'E.), entered between Lilleore on the W side and Havnehage on the E side, extends about 3 miles S and is obstructed by numerous islets, rocks, and shoals. The depths in this fjord are less than 0.9m, except in a narrow winding channel along its W side.

Langor Havn (55°55'N., 10°39'E.), a small harbor sheltered by a breakwater on its W and SW sides and by pilings on its SE side, lies on the NW side of Stavns Fjord. Only small vessels can be accommodated alongside the wharf within the harbor area.

Between Havnehage, the E entrance point to Stavns Fjord, and Lushage about 10 miles to the S, the highest elevation along the coast is Staalhoj Hage, a point about 4 miles S of Havnehage. The remaining stretch of coast S to Lushage is low. Conspicuous objects consist of a church about 2 miles WSW of Staalhoj Hage; a mill 0.75 mile SW of the church; and Brunby mill about 1 mile NW of Ballen Hage, a point with a loading place about 4 miles SW of Staalhoj Hage.

The coastal bank extends up to 1 mile offshore from the spit, forming the E side of Stavns Fjord. The coast rapidly closes farther S, with a maximum width of 0.25 mile thereafter.

Ballen (55°49'N., 10°39'E.), a small coastal harbor protected by breakwaters, has a normal depth of 3.5m in the entrance and outer harbor but shoals to a depth of 2.6m in the inner harbor.

The quays within the harbor basins have depths which range from 4.3 to 4.9m alongside. The harbor master acts as pilot.

Samso—Westside—South Side.—The W coast of Nordby Land extends about 2 miles SW from Issehoved to Kolsor Hage and then extends about 3 miles S to Asmindor Hage. With the exception of Issehoved, this part of the coast is hilly. The coastal banks fringing this part of the coast is narrow and steep-to.

Between Asmindor Hage and Saelvig Pier, about 5 miles S, the coast recedes to form a bay with general depths from 9.1 to 13.7m and low shores. The NE part of the bay is named Maarup Vig and the SE part Saelvig. The coastal bank fringing the shores of the bay lies between 0.25 to 0.5 mile offshore.

Maarup Havn (55°56'N., 10°33'E.), a shallow harbor with two basins, is protected on its W side by a breakwater. A dredged, buoyed channel with a depth of 2.4m, leads into the

basins, which have depths ranging from 1.5 to 2.4m. Lesser depths may be encountered due to silting. The harbor master acts as pilot.

Saelvig Pier (55°52'N., 10°33'E.), with a depth of 3m at its outer end, extends NNW about 190m offshore on the W side of Saelvig Bay.

Ringebjerger, two 25m high hills, stands close to the coast about 1 mile SW of Saelvig Pier. Between Ringebjerger and Vesborg Light on the SW end of Samso, about 5 miles to the S, the coast consists of a series of bluffs and low shore. Several conspicuous churches stand along this stretch of land. The houses at Kolby Kaas and a windmill about 0.5 mile to the W of the town are also conspicuous from the offing.

Ringebjerg Sand, an area of shoal ground with depths of about 6m at its outer edge, extends up to 1 mile W and 2 miles NW from Ringebjerg. South of this shoal, as far S as Vesborg Light, the coastal bank lies within 0.5 mile of the coast.

8.29 Kolby Kaas (55°48'N., 10°32'E.), a small harbor protected by two breakwaters, is divided into two basins by a central mole. The buoyed entrance channel is dredged to 6m. Depths in the harbor are 5.2m in the N basin and 4.2m in the S basin. The mean range of the tide is about 0.6m. The water level may be raised about 0.9m by NW to N gales and lowered a similar amount by gales from SE to SW. Strong SW to NW gales raise a sea in the harbor.

Pilots are available.

Aspect.—The S coast of Samso between Vesborg Light and Lushage is generally low and has two yellow cliffs in its middle part. The most conspicuous objects on this side of the island are Vesborg Light; Brattingsborg Skov, a clump of woods about 2 miles E of the light; and the light structure on Lushage.

The 10m curve lies from 0.75 to about 1 mile offshore along the S coast of Samso. Numerous shoal patches with lesser depths lie within this curve.

Paludans Flak (55°44'N., 10°34'E.), an area of shoal ground about 2 miles long in a N and S direction, lies centered about 3 miles S of Vesborg Light. Depths over this shoal are less than 9.1m. The passage between Paludans Flak and the coastal bank extending from Samso is free from danger except for the two shoals which lie within 1 mile S and SW of Lushage.

Lillegrund, a reef with a least depth of 1.2m, lies about 2 miles N of Fyns Hoved which lies about 8.75 miles S of Lushage. The reef is connected to the 5.5m coastal bank which extends N from Fyns Hoved by a ridge. A channel about 0.3 mile wide, with a 4.9m patch on its N side, lies between the reef and the bank and leads W across the ridge.

A rocky shoal, with a depth of 5.5m, lies about 3 mile N of the NE extremity of Fyns Hoved. Several other detached shoals, with depths of 6.4 to 9.8m, lie between Lillegrund and Paludans Flak.

The channel across the ridge S of Lillegrund has no navigational aids to mark it other than the fairway buoys. A depth of not more than 4.9m exists and must be taken into account prior to making the transit.

Approaches.—Vessels bound for Lille Baelt from the N can pass either E or S of Samso, or N and W of the island. The principal approaches to the latter route are Hjelm Dyb, the channel between Moselgrund and Marthe Flak, and the channel between Marthe Flak and Vejro Flak. Hjelm Dyb is considered the best of these three channels for vessels drawing up to 7.6m, and the other channel between Moselgrund and Marthe Flak is the most suitable for deep-draft vessels.

Caution.—An area in which anchoring, fishing, or seabed activity is dangerous due to mines, lies close S of Vesborg Light.